Acrosser Technology Co., Ltd.

AR-B1894

Intel Pentium M
Mini ITX Main Board

User's Manual
V 1.2

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We hope you to get the maximum performance from your products and be willing to help if running into technical difficulties. For the most frequently asked questions, it's easily found answers from the product documentation and usually a lot more detailed, so please take reference to this manual first. If the answer still can not be found, gather all the information or questions applying to the problem, and with the product on hand, contact your distributor, sales representative, or customer service center for technical support. Most problems reported are minor and able to be easily solved over the phone. In addition, free technical support is available and always ready to give advices on application requirements or specific information on the installation and operation of any of our products.
Please have the following information ready before you call:

1. Product name and serial number
2. Description of your peripheral attachments
3. Description of your software (operating system, version, application software, etc.)
4. A complete description of the problem
5. The exact wording of any error messages

How to Use This Manual

This manual is written for the system integrator, PC technician and knowledgeable PC end user. It describes how to configure your AR-B1894 to meet various operating requirements. The user's manual is divided into four chapters, with each chapter addressing a basic concept and operation of the server board.

Chapter 1: Introduction - presents what you have inside the box and gives you an overview of the product specifications and basic system architecture for the AR-B1894 server board.

Chapter 2: Hardware Configuration Setting - shows the definitions and locations of Jumpers and Connectors so that you can easily configure your system.

Chapter 3: System Installation - describes how to properly mount the CPU, main memory, and M-System Flash disk for a safe installation. It will also introduce and show you the driver installation procedure for the Graphics Controller and Ethernet Controller.

Chapter 4: BIOS Setup Information - specifies the meaning of each setup parameter, how to get advanced BIOS performance and update to a new BIOS.

Note:

(1) Memory type support dual-channel interleaved mode assuming DDR2 533 MHz, all DIMMs in a system must be of the same type, the speed in all channels is the speed of the slowest DIMM in the system.

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1. Introduction

1.1 Description

The AR-B1894 all-in-one Mini ITX is designed to fit a high performance Pentium M based processor and compatible for high-end computer system application with PCI bus architecture. It is made to meet today's demanding pace, and keep complete compatibility with hardware and software designed for the IBM PC/AT. The on-board devices support one PCI slot, integrated graphics, and on-board three Marvell Gigabit Ethernet controllers. It's beneficial to build up a high performance and high data availability system for VARs, or system integrators.

AR-B1894 support the following processors:

Intel ® uFC-PGA 478 Pentium M® / Celeron M processor FSB 400/533 MH with 0.90 and 0.13 micron technology.

This Mini ITX can run with Intel Socket 479 Pentium/Celeron M processors and support DIMM up to 2 GB dual-channel DDR2 533 memory. The enhanced on-board one PCI-IDE interface can support 1 drive up to PIO mode 4 timing and Ultra ATA 33/66/100 synchronous mode feature, one CF socket interface, and 2 Serial ATA high-speed data transfers at up to 150 MB/s connectors. The on-board Super I/O chipset supports two serial ports, one SIR (Serial Infrared) port, two high performance 16C550-compatible UARTs provide 16-byte send/receive FIFOs, and two RS-232 serial port interfaces. Besides, H/W monitor function, Intel High Definition Audio as 5.1 surround sound, six Hi-Speed USB 2.0 ports offering up to 40X greater bandwidth over USB 1.1. Also provide dual display function by VGA and DVI, by VGA, and LVDS interface.

The Mini-ITX standard makes the AR-B1894 work with the one slot PCI and one 6-pin Mini-DIN connector for PS/2 mouse and keyboard. The on-board Flash ROM is used to make the BIOS update easier. The high precision Real Time Clock/calendar is built to support Y2K for accurate scheduling and storing configuration information. One 20-pin standard connector is designed to support ATX power function. A feature of CPU overheat protection will give user more security and stability. All of these features make AR-B1894 series excellent in stand-alone applications.

Note: 1) The AR-B1894 only support Intel Pentium/Celeron M processor (Dothan 400/533 FSB) for 0.13 and 0.90 micron.

2) The AR-B1894 only support DDR2 533 memory module.

1.2 Packing Check List

The AR-B1894 package includes the following basic items accompany with this manual.

- One AR-B1894 Mini ITX
- One Quick Installation Guide for AR-B1894
- One 40-pin IDE cable
- One Serial ATA cable
- One Serial port cable for COM2
- One I/O Shield bracket
- One Supporting CD-ROM contains User's Manual and internal VGA display driver and Marvell Gigabit Ethernet network controller driver and on board devices drivers

If any of these items is damaged or missed, please contact your vendor and save all packing materials for future replacement and maintenance.

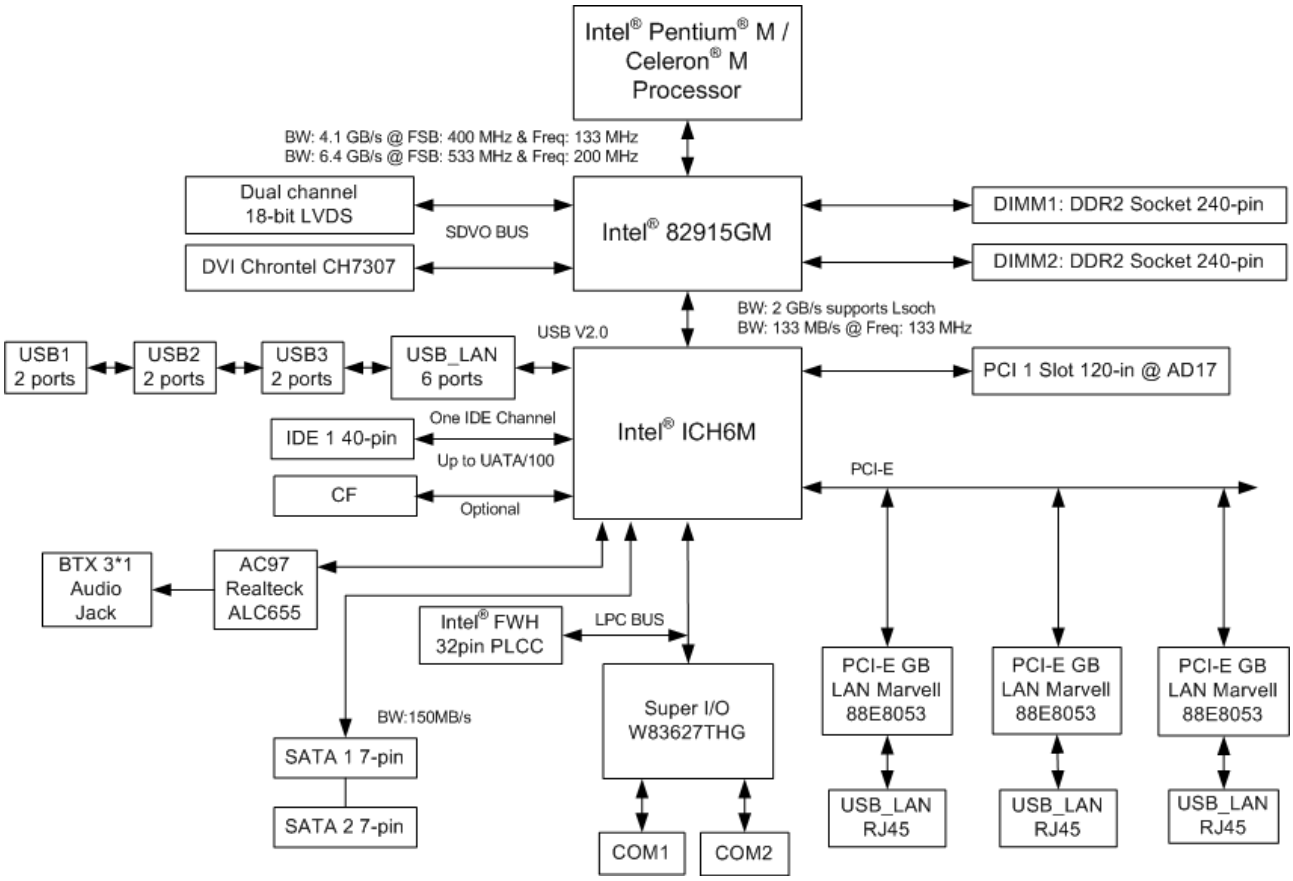
1.3 Specifications

System	
CPU	Supports Intel µFC-PGA 478 Pentium® M / Celeron® M Processor with 65nm / 90nm process technology, up to 2.26G / 2.0G
FSB	FSB 533/400 MHz
BIOS	Award BIOS with 4 Mb Flash ROM
System Chipset	Intel® 915GM + ICH6M
I/O Chip	Winbond W83627THG-AW supports two serial ports
System Memory	2 x 240-pin DIMM sockets support dual channel DDR2 from 128 MB to 2 GB at 400/533 MHz memory bus
Storage	1 x Ultra DMA100/66/33 support two IDE devices by 40-Pin IDE connector ; 2 x Serial ATA connectors high-speed data transfer at up to 150 MB/s
SSD	1 x CompactFlash Type I/II Socket
Watchdog Timer	Reset: 1 sec.~255 min. and 1 sec. or 1 min./step
H/W Status Monitor	Monitoring system temperature, voltage, and cooling fan status. Auto throttling control when CPU overheats. System automatically restored on recovery of AC power loss.
Real Time Clock	Built-in ICH6M with Y2K compliant
GPIO	On-board programmable 8-bit Digital I/O interface
Expansion	1 x 32-bit PCI slot compliant with PCI v2.3 specification
MIO	
Internal	1 x RS-232, 4 x USB 2.0
External	1 x RS-232, 1 x K/B, 1 x Mouse, 3 x LAN & 2 x USB 2.0
Display	
Chipset	Intel® 915GM Integrated Intel® GMA 900 graphics
Display Memory	Intel® DVMT 3.0 supports up to 128 MB video memory
Resolution	CRT mode: support maximum resolution up to 2048 x 1536 at fresh rate 75Hz (QXGA) Multiple maximum overlay display resolution up to 1600x1200 at 85 Hz (UXGA)
VGA/LCD Interface	DSUB-15 VGA connector for DAC output
LVDS	Dual Channel 18-bit LVDS
DVI	Chrontel CH7307 DVI transmitter

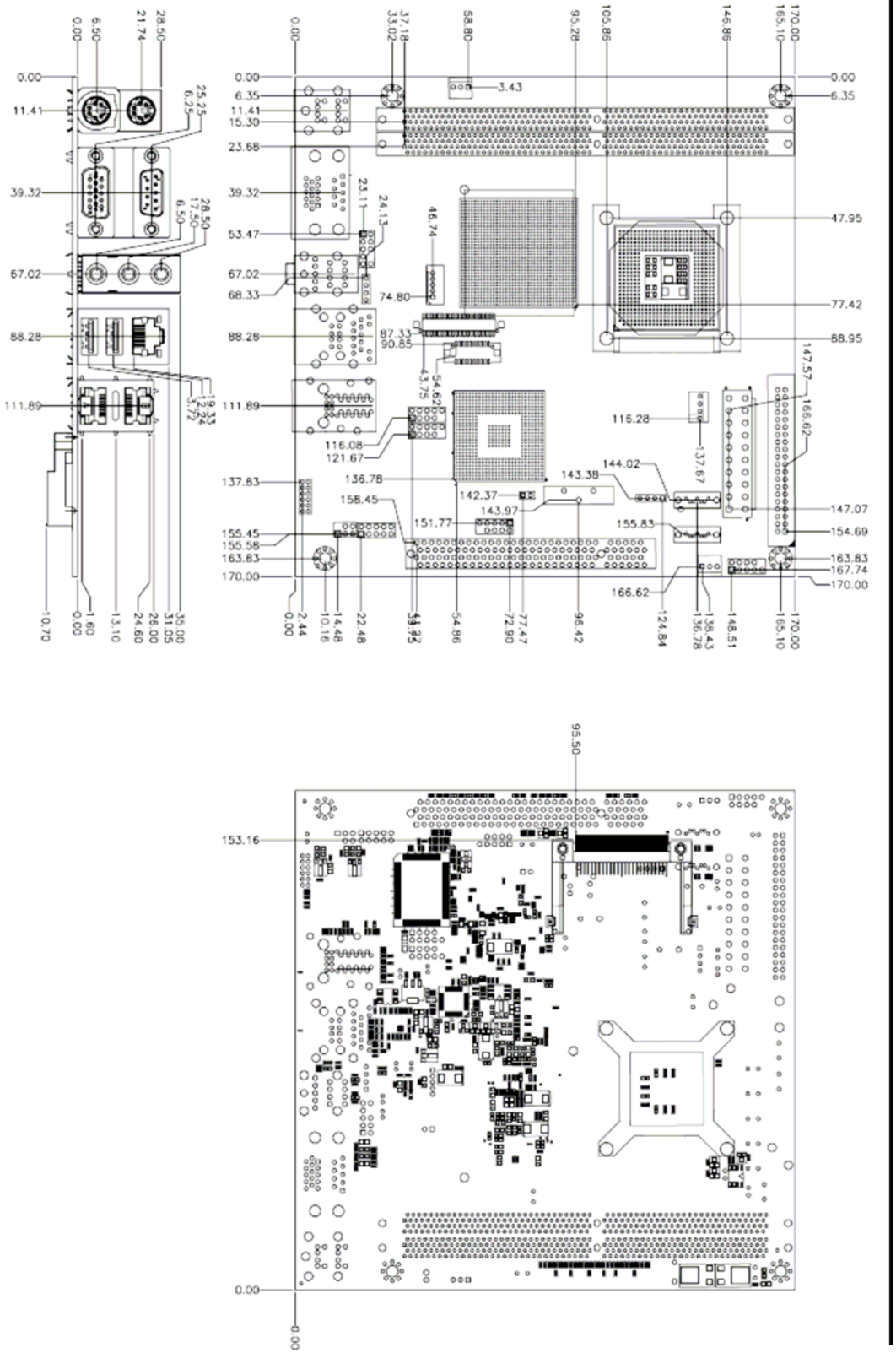
Audio	
Chipset	Intel® ICH6M
AC97 Codec	Realtek ALC655 AC97 5.1 CH 3D audio interface
Audio Interface	Mic in, Line in, CD Audio in, Line out, Rear out and Center/Subwoofer out
Ethernet	
Chipset	Three Marvell® Yukon™-EC 88E8053 PCI Express™ Ethernet controllers
Ethernet Interface	IEEE 802.3 10/100/1000BASE-T Gigabit Ethernet compliant
Mechanical & Environmental	
Power Requirement	3.3 V @ 3.4 A, +5 V @ 359 mA, +12 V @ 1,92 A , -12 V @ 294 mA, 5 Vsb @ 263 mA
Power Type	ATX
Operating Temperature	0~60°C (32~140°F)
Operating Humidity	0%~90% relative humidity, non-condensing
Size (L x W)	6.69" x 6.69" (170 mm x 170 mm)
Weight	0.94 lbs (0.43 Kg)

1.4 System Architecture

All of details operating relations are shown in AR-B1894 system block diagram.



1.5 Dimensions



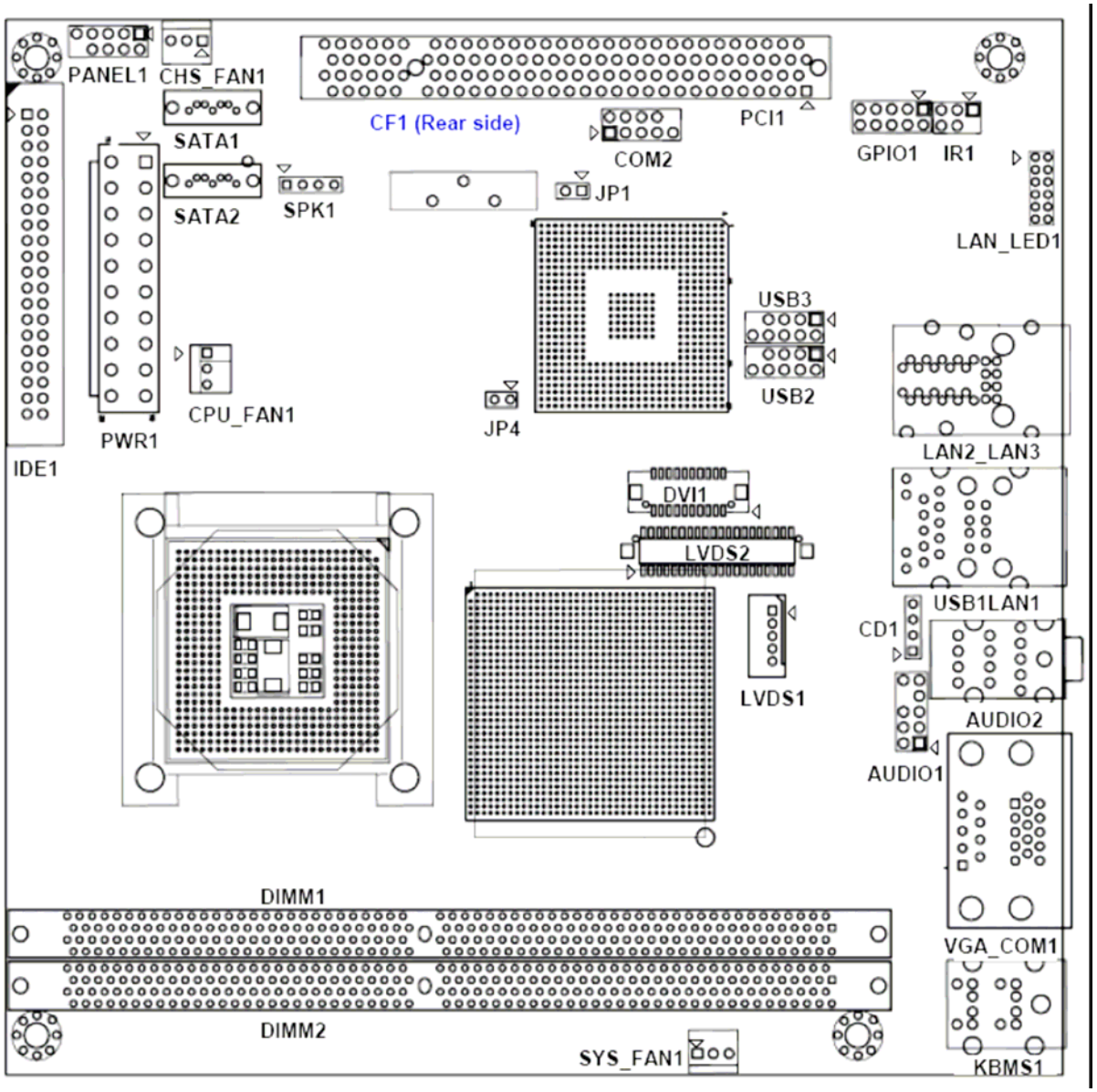
Unit: mm

2. Hardware Configuration Setting

This chapter gives the definitions and shows the positions of jumpers, headers and connectors. All of the configuration jumpers on AR-B1894 are in the proper position. The default settings shipped from factory are marked with an asterisk (★).

In general, jumpers on the Mini ITX are used to select options for certain features. Some of the jumpers are designed to be user-configurable, allowing for system enhancement. The others are for testing purpose only and should not be altered. To select any option, cover the jumper cap over (SHORT) or remove (NC) it from the jumper pins according to the following instructions. Here, NC stands for “Not Connect”.

2.1 Board Layout



2.2 Jumpers & Connectors

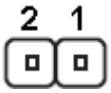
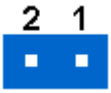
JUMPERS	FUNCTION	REMARK
JP1	RTC CMOS clear select	2 x 1 header
JP4	CPU frequency select	2 x 1 header

CONNECTORS	FUNCTION	REMARK
AUDIO1	Internal audio for chassis	2 x 5 header
AUDIO2	Audio connector	Audio jack x 3
CD1	CD-In from CD-ROM	1 x 4 header
CF1	CompactFlash card connector	
CHS_FAN1	Chassis fan connector	
CPU_FAN1	CPU fan connector	
COM2	Serial port 2 connector	2 x 5 header
DIMM1, DIMM2	240-pin DDR2 SDRAM 1 & 2 socket	
DVI1	DVI connector	HIROSE
GPIO1	GPIO connector	2 x 5 header
IDE1	Primary IDE connector	2 x 20 header
IR1	IrDA connector	2 x 3 header
KBMS1	PS/2 keyboard & mouse connector	
LAN_LED1	LAN LED connector	2 x 6 header
LAN2_LAN3	LAN 2 & LAN 3 connectors	
LVDS1	LCD inverter connector	
LVDS2	LVDS connector	HIROSE
PANEL1	Front side indicators:	2 x 5 header

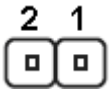
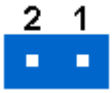
	IDE1 active LED (1-3) System power on LED (2-4) System reset LED (5-7) System power on switch LED (6-8)	
PCI1	PCI slot	
PWR1	24-pin ATX power connector	
SATA1, SATA2	Serial ATA 1 & 2 connector	
SPK1	Internal speaker connector	1 x 4 header
SYS_FAN1	System fan connector	
USB1LAN1	USB 1, 2 & LAN 1 connectors	
USB2, USB3	Internal USB 3, 4 & 5, 6 connectors	2 x 5 header
VGA_COM1	D-sub 15-pin VGA & D-sub 9-pin serial port 1 connectors	

2.3 Jumpers/Connectors Setting

2.3.1 RTC CMOS Clear Select (JP1)

OPEN★	SHORT
	
Normal Operation	Clear CMOS contents

2.3.2 CPU Frequency Select (JP4)

OPEN★	SHORT
	
400 MHz	533 MHz

2.3.3 Internal Audio for Chassis (AUDIO1)

PIN No.	Description
1	F_MIC1
2	Ground
3	F_MIC2
4	+5V
5	LOUTR
6	F_R
7	NC
8	NC
9	LOUTL
10	F_L

2.3.4 Audio Connector (AUDIO2)

PIN No.	Description
1 (Blue)	Line-in
2 (Green)	Speaker out
3 (Red)	MIC-in

2.3.5 CD-In from CD-ROM (CD1)

PIN No.	Description
1	CD-L
2	CD-Ground
3	CD-Ground
4	CD-R

2.3.6 Chassis/CPU/System Connectors (CHS_FAN1, CPU_FAN1, SYS_FAN1)

PIN No.	Description
1	GND
2	+12V
3	SENSE
4	Control (CPU_FAN1 only)

2.3.7 COM1 / VGA & COM2 Connector (COM2, VGA_COM1)

COM1 / COM2

PIN No.	Description
1	Data Carrier Detect
2	Received Data
3	Transmit Data
4	Data Terminal Ready
5	Ground
6	Data Set Ready
7	Request To Send
8	Clear To Send
9	Ring Indicator
10	Not used

VGA

Description	PIN No.	PIN No.	Description
Green Signal	2	1	Red Signal
NC	4	3	Blue Signal
Ground	6	5	Ground
Ground	8	7	Ground
Ground	10	9	+5V
DCC_DATA	12	11	NC
VSYNC	14	13	HSYNC
		15	DCC_CLK

2.3.8 DVI Connector (DVI

Description	PIN No.	PIN No.	Description
TDC0#	2	1	+5V
TDC0	4	3	GND
NC	6	5	NC
NC	8	7	NC
TDC1#	10	9	HPDET
TDC1	12	11	MDVIDATA
NC	14	13	MDVICLK
NC	16	15	Ground
TDC2#	18	17	TLC#
TDC2	20	19	TLC

Signal	Type	Description
TDC0,TDC0#	O	**DVI Data Channel 0 Output**: These pins provide the DVI differential output for data channel 0 (Blue).
TDC1,TDC1#	O	**DVI Data Channel 1 Output**: These pins provide the DVI differential output for data channel 1 (Green).
TDC2,TDC2#	O	**DVI Data Channel 2 Output**: These pins provide the DVI differential output for data channel 2 (Red).
HPDET	I	**Hot Plug Detect (internal pull-down)**: This input determines whether the DVI is connected to a DVI monitor. When terminated , the monitor is required to apply a voltage greater than 2.4 volts. Changes on the status of this pin will be relayed to the graphics controller via the P-OUT/TLDET* or GPIO(1)/TLDET* pin pulling low.
TMDSDATA	I/O	**DVI I2C Data**: This signal is used as the I2C DOC clock for a digital display connector (i.e. TV-Out Encoder , TMDS transmitter). This signal is tri-stated during a hard reset.
TMDSDCLK	I/O	**DVI DOC Clock**: This signal is used as the DOC clock for a digital display connector (i.e. primary digital monitor). This signal is tri-stated during a hard reset.
TLC,TLC#	O	**DVI Clock Output:** These pins provide the differential clock outputs to the DVI interface corresponding a data on TDC(0:2) outputs.

2.3.9 GPIO Connector (GPIO1)

PIN No.	Description
1	+3.3V
2	General Purpose I/O bit 3
3	General Purpose I/O bit 5
4	General Purpose I/O bit 0
5	General Purpose I/O bit 7
6	General Purpose I/O bit 2
7	General Purpose I/O bit 4
8	General Purpose I/O bit 1
9	General Purpose I/O bit 6
10	Ground

2.3.10 IrDA Connector (IR1)

PIN No.	Description
1	NC
2	NC
3	+5V
4	Infrared transmitter output
5	Ground
6	Infrared receiver input

2.3.11 PS/2 Keyboard & Mouse (KBMS1)

PIN No.	Description
1	Keyboard Data
2	Mouse Data
3	Ground
4	+5V
5	Keyboard Clock
6	Mouse Clock

2.3.12 LAN LED Connector (LAN_LED1)

PIN No.	Description
1	L1_LED_LINKACT
2	L1_LED_LINK100
3	L1_LED_LINKACT_V
4	L1_LED_LINK1000
5	L2_LED_LINKACT
6	L2_LED_LINK100
7	L2_LED_LINKACT_V
8	L2_LED_LINK1000
9	L3_LED_LINKACT
10	L3_LED_LINK100
11	L3_LED_LINKACT_V
12	L3_LED_LINK1000

2.3.13 LAN 1/2/3 & USB 1/2 Connectors (LAN2_LAN3, USB1LAN1)

LAN 1/2/3

PIN No.	Description	PIN No.	Description
1	TX+	5	NC
2	TX-	6	RX-
3	RX+	7	NC
4	NC	8	NC

USB 1/2

PIN No.	Description	PIN No.	Description
1	+5 V (fused)	5	+5 V (fused)
2	USBP0-	6	USBP1-
3	USBP0+	7	USBP1+
4	Ground	8	Ground

2.3.14 LCD Inverter Connector (LVDS1)

PIN No.	Description
1	+12V
2	Ground
3	Backlight On/Off control
4	Backlight brightness adjustment
5	+5V

2.3.15 LVDS Connector (LVDS2)

Description	PIN No.	PIN No.	Description
+5V	2	1	+3.3V
+5V	4	3	+3.3V
Ground	6	5	Ground
LCTLB_CLK_L	8	7	LDDC_CLKL
LCTLB_DATA_L	10	9	LDDC_DATA_L
Ground	12	11	Ground
Ground	14	13	Ground
A_CLK-	16	15	B_CLK-
A_CLK+	18	17	B_CLK+
Ground	20	19	Ground
A_DATA0-	22	21	B_DATA0-
A_DATA0+	24	23	B_DATA0+
Ground	26	25	Ground
A_DATA1-	28	27	B_DATA1-
A_DATAP+	30	29	B_DATA1+
Ground	32	31	Ground
A_DATA2-	34	33	B_DATA2-
A_DATA2+	36	35	B_DATA2+
Ground	38	37	Ground
+12V	40	39	+12V

Signal	Type	Description
LCTLB_CLK_L	I/O	I^2C Based control signal (Clock) for External SSC clock chip control
LCTLB_DATAL	I/O	I^2C Based control signal (Data) for External SSC clock chip control
LDDC_CLKL	I/O	EDID support for flat panel display
LDDC_DATAL	I/O	EDID support for flat panel display

2.3.16 Front Side Indicators (PANEL1)

IDE1 Active LED

PIN No.	Signal Description
1	+5V (Pull-up for HDD LED)
3	HDD active# (LED cathode terminal)

System Reset LED

PIN No.	Signal Description
5	Reset
7	Ground

System Power On Switch LED

PIN No.	Signal Description
6	Power button control signal
8	Ground

2.3.17 24-pin ATX Power Connector (PWR1)

Description	PIN No.	PIN No.	Description
+3.3V	13	1	+3.3V
-12V	14	2	+3.3V
Ground	15	3	Ground
PS_ON	16	4	+5V
Ground	17	5	Ground
Ground	18	6	+5V
Ground	19	7	Ground
-5V	20	8	PW_OK
+5V	21	9	5VSB
+5V	22	10	+12V
+5V	23	11	+12V
Ground	24	12	+3.3V

2.3.18 Serial ATA 1/2 Connectors (SATA1, SATA2)

These SATA connectors support Serial ATA 150. Each SATA connector can only support one serial ATA device.

Note: With most storage devices, there is a power cable that you need attach to a power source (power supply).

2.3.19 Internal Speaker Connector (SPK1)

PIN No.	Description
1	Ground
2	Ground
3	NC
4	+5V

2.3.20 Internal USB 3/4/5/6 Connectors (USB2, USB3)

PIN No.	Description
1	5VSB
2	5VSB
3	DATA_3- / DATA_5-
4	DATA_3- / DATA_5+
5	DATA_4+ / DATA_6-
6	DATA_4+ / DATA_6+
7	Ground
8	Ground
9	NC
10	NC

Note :

1) This mainboard provides 2 USB headers on the board allowing for 4 additional USB ports. To make use of these headers, you must attach a USB bracket/cable with USB ports (some models will come packaged with a USB 4-port bracket-cable). The optionally packaged bracket will have two connectors that you can connect to the headers (USB1, USB2). The other end (bracket containing the USB ports) is attached to the computer casing.

2) If you are using a USB 2.0 device with Windows 2000/XP, you will need to install the USB 2.0 driver from the Microsoft® website. If you are using Service pack 1 (or later) for Windows® XP, and using Service pack4 (or later) for Windows® 2000, you will not have to install the driver.

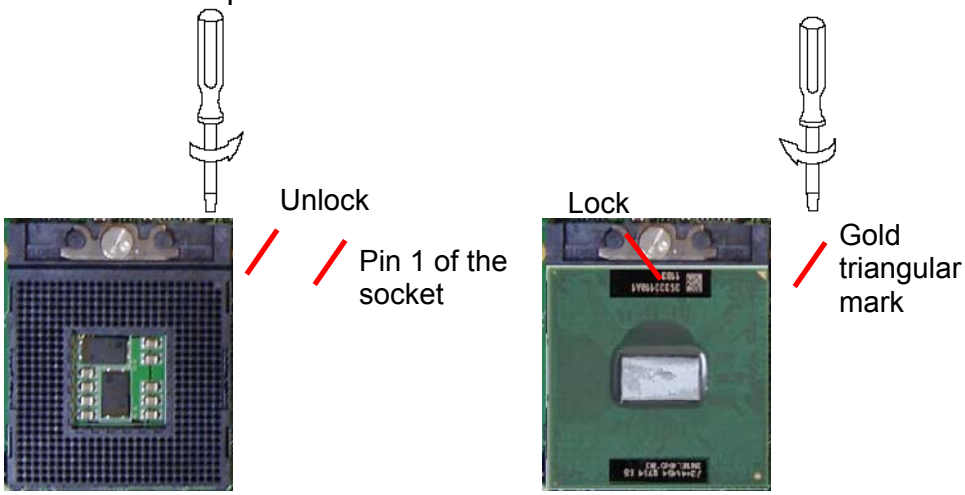
3. System Installation

This chapter provides you with instructions on how to setup your system. The additional information shows you how to install CPU/ FAN and memory.

3.1 Socket 478 Processors

3.1.1 Installing Intel® Pentium® M / Celeron® M CPU

- The processor socket comes with a screw to secure the processor, please unlock the screw first.
- Position the CPU above the socket and the gold triangular mark on the CPU must align with pin 1 of the CPU socket. Then Insert the CPU gently seated in place.
- Turn the screw to the lock position.



Note: Do not force the CPU into the socket. It may bend the pins and damage the CPU.

3.2 Installing Cooling Fan

Warning： For a safety landing, avoid leaving prongs on hard surface.

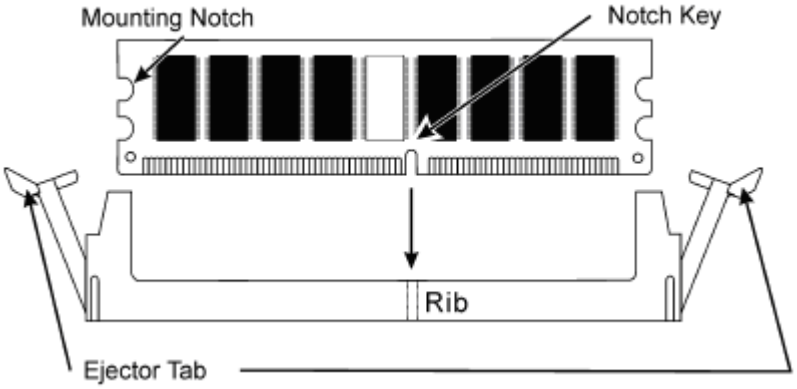
Instructions： Smear thermal grease on the top of the CPU. Lower the CPU fan onto the CPU/CPU socket and secure it using the attachments or screws provided on the fan. Finally, attach the fan power cable to the CPUFAN adapter. For more details on this, go to http://www.intel.com

3.3 Main Memory

AR-B1894 series provide 2 DIMMs (240-pin Dual In-line Memory Module) to support 1.5V DDRAM (Synchronized DRAM) as on-board main memory. The maximum memory size is 256 MB ~ 2 GB with using 256MB/512MB/1GB technology. Supports up to 2 double sided DIMMs at DDR2 533MHz. The memory architecture adopts 128-bit data interface to support for x8 and x16 DDRAM(DDR2) device width. In addition, it only supports Non-ECC memory.

For system compatibility and stability, don't use memory module without brand. You can also use the single or double-side DIMM .The three DIMMs can be out of order. You can install different size of DDRAM module on DIMM1, DIMM2 or all to boot up system.

Without out the contact and lock integrity of memory module with socket, it will impact on the system reliability. Follow normal procedure to install your DDRAM module into memory socket. Before locking, make sure that the module has been fully inserted into the DIMM slot.



NOTE: For maintaining system stability, do not change any of DDR2 memory parameters in BIOS setup to upgrade your system performance without acquiring technical information.

3.4 Installing the Mini-ITX

To install your AR-B1894 into standard chassis or proprietary environment, you need to perform the following steps:

1. Check all jumpers setting on proper position
2. Install and configure CPU and memory module on right position
3. Place AR-B1894 into the dedicated position in your system
4. Attach cables to existing peripheral devices and secure it

NOTE: Please refer section 3.4 to install display and Ethernet drivers and setup your system.

WARNING: Please ensure that your SBC properly inserted and fixed by mechanism. Otherwise, the system might be unstable or do not work from bad contact of golden finger.

3.4.1 Intel 915GM Integrated Graphics Controller

The on-board graphics controller integrated in 915GM(GMCH) chipset that integrates high performance memory technology , the on-board operates at a frequency of 2.5Gb/s on each lane while employing 8b/10b encoding, and supports a maximum theoretical bandwidth of 4Gb/s each direction, the 82915GM GMCH multiplexes the PCI Express interface with DVI & CRT support. The chipset supports the following modes.

Resolution	Bits Per Pixel (frequency in Hz)		
	256 Color	**16-bit**	**32-bit**
640x480	60,70,72,75,85,100,120	60,70,72,75,85,100,120	60,70,72,75,85,100,120
800x600	60,70,72,75,85,100,120	60,70,72,75,85,100,120	60,70,72,75,85,100,120
1024x768	60,70,72,75,85,100,120	60,70,72,75,85,100,120	60,70,72,75,85,100,120
1152x864	60,75,85,100	60,75,85,100	60,75,85,100
1280x600	60	60	60
1280x720	60,75,85,100	60,75,85,100	60,75,85,100
1280x768	60,75,85	60,75,85	60,75,85
1280x960	60,75,85	60,75,85	60,75,85
1280x1024	60,75,85,100,120	60,75,85,100,120	60,75,85,100,120
1400x1050	60,75,85	60,75,85	60,75,85
1600x900	60,75,85,100,120	60,75,85,100,120	60,75,85,100,120
1600x1200	60,75,85,100,120	60,75,85,100,120	60,75,85,100,120
1856x1392	60,75	60,75	60,75
1920x1080	60,75,85,100	60,75,85,100	60,75,85,100
1920x1200	60,75,85	60,75,85	60,75,85
1280x1024	60,75	60,75	60,75
1920x1440	60,75,85	60,75,85	60,75,85
2048x1536	60,75	60,75	60,75

3.4.2 Triple Marvell Gigabit Ethernet Controller

Triple Marvell Gigabit Ethernet 10/100/1000BASE-TX controller by PCI Express. The AR-B1894 series provide three LED indicators on RJ-45 connectors to show LAN interface status. These messages will give you a guide for troubleshooting.

LAN1:

Yellow LED indicates transmit and receive activity.

Blinking: indicates transmit/receive activity
On: indicates no activity but link is valid
Off: link is invalid

Green LED indicates Link speed

On: link speed at 1000Mbps
On: link speed at 100Mbps
Off: link speed at 10Mbps

LAN2, 3:

Red LED indicates transmit and receive activity.

Blinking: indicates transmit/receive activity
On: indicates no activity but link is valid
Off: link is invalid

Green LED indicates Link speed

On: link speed at 100Mbps
Off: link speed at 10Mbps

Orange LED indicates Link speed

On: link speed at 1000Mbps
Off: link speed at 10Mbps

3.4.3 Drivers Support

AR-B1894 provide on CD-Title to support on-board VGA and Ethernet device drivers in various operating systems. Before installing the device drivers, please see the reference files in each sub-directory. You cannot install drivers from CD-Title directly.

Intel 915GM Chipset Integrated Graphics supports Win2000, XP, Win2003 and 64bit Windows environment.

Intel 915GM & ICH6(M) Chipset Driver supports Win2000, XP, Win2003 and 64bit Windows environment.

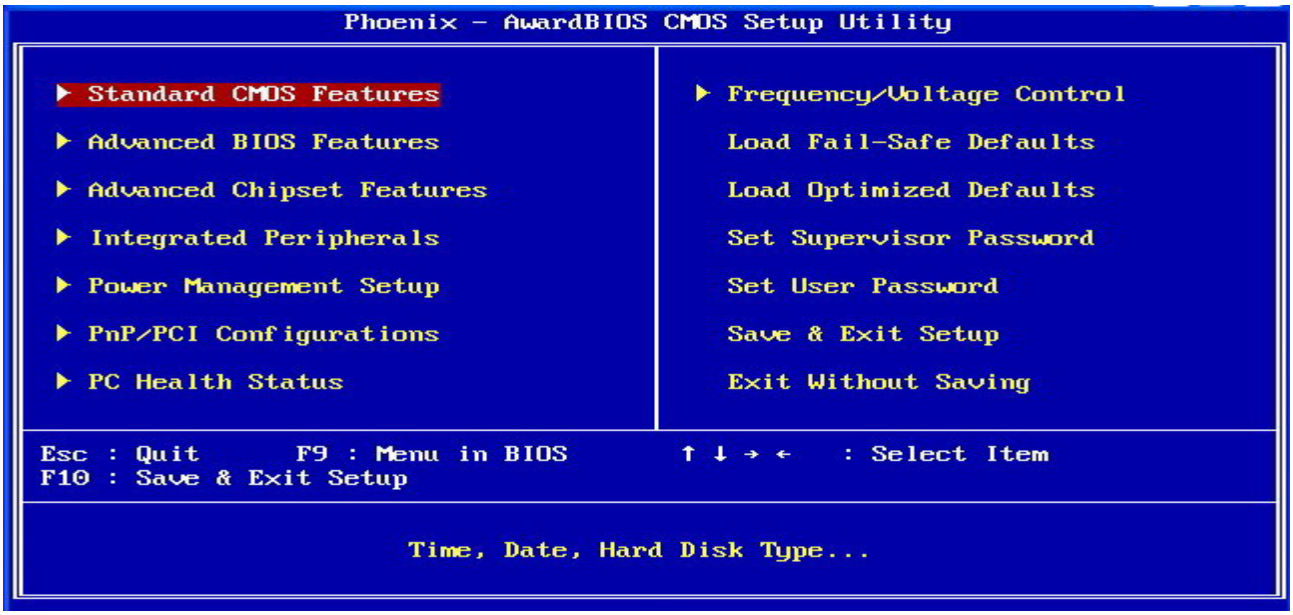
Three Marvell Gigabit Ethernet Controllers support Win2000, XP, Win2003, and 64 bit Windows environment.

4. BIOS Setup

4.1 Entering Setup

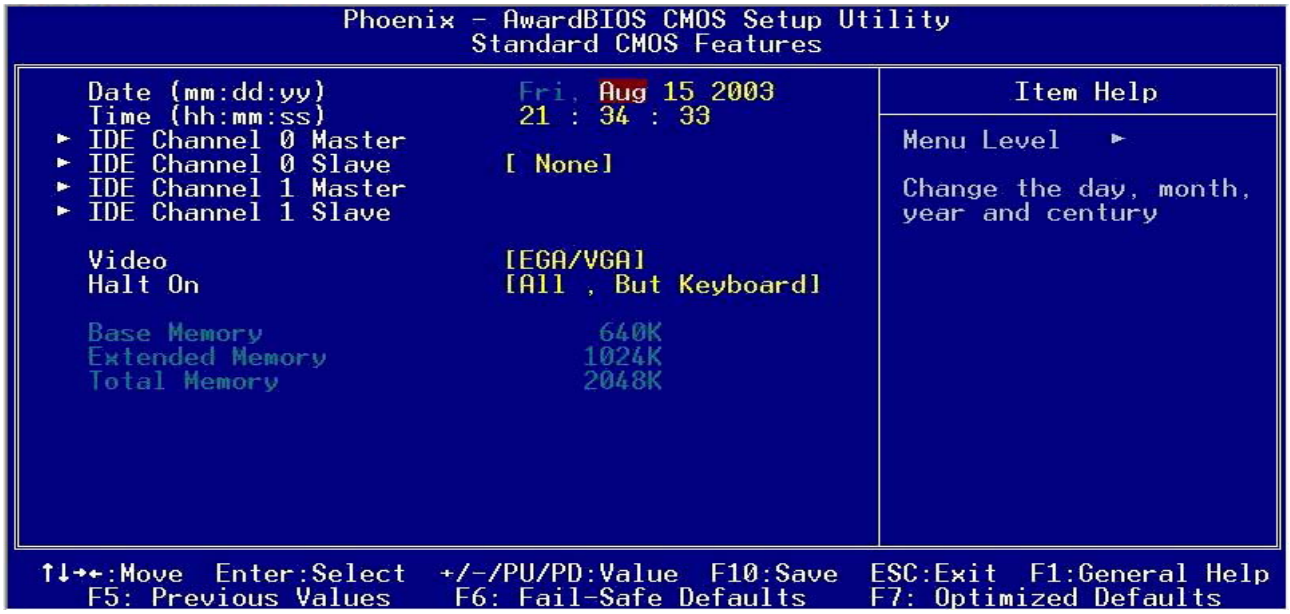
Phoenix-Award BIOS has a built-in setup program that allows users to modify the basic system configuration. This information is stored in CMOS RAM whose power is supplied by a battery so that it can retain the setup information even when the power is turned off. Press Delete when you Power on or Reboot the computer system. (i.e. After the logo appears at the center of the screen, please press Delete to enter the BIOS setup program). In the BIOS, make sure that everything is working fine before you try to optimize it for maximum performance.

4.2 Main Menu



When you enter the PHOENIX-AWARD™ CMOS Setup Utility, the **Main** will appear on the screen. The Main allows you to select several configuration options. Use the left/right arrow keys to highlight a particular configuration screen from the top menu bar or use the down arrow key to access and configure the information below.

4.2.1Standard CMOS Features



4.2.1.1 Date (mm/date/year) and Time (hh/mm/ss)

Allow you to change the date and time of the system clock. No matter how good the quality of the motherboard, remember that losing (or gaining) several seconds per month is not a surprising thing.

4.2.1.2 IDE Channel 0 Master/Slave

You can press **Enter** to see the submenus they contain.

4.2.1.3 Video

Allows you to select the type of displaying standard you are using. Available options are **EGA/VGA, CGA 40, CGA 80 and MONO.**

4.2.1.4 Halt On

Select the situation in which you want the BIOS to stop the POST process and notify you. Available options are **All Errors, No Errors, All, but keyboard, All, but diskette,** and **All, but disk/key**.

4.2.1.5 Base Memory

Displays the amount of conventional memory detected during boot up.

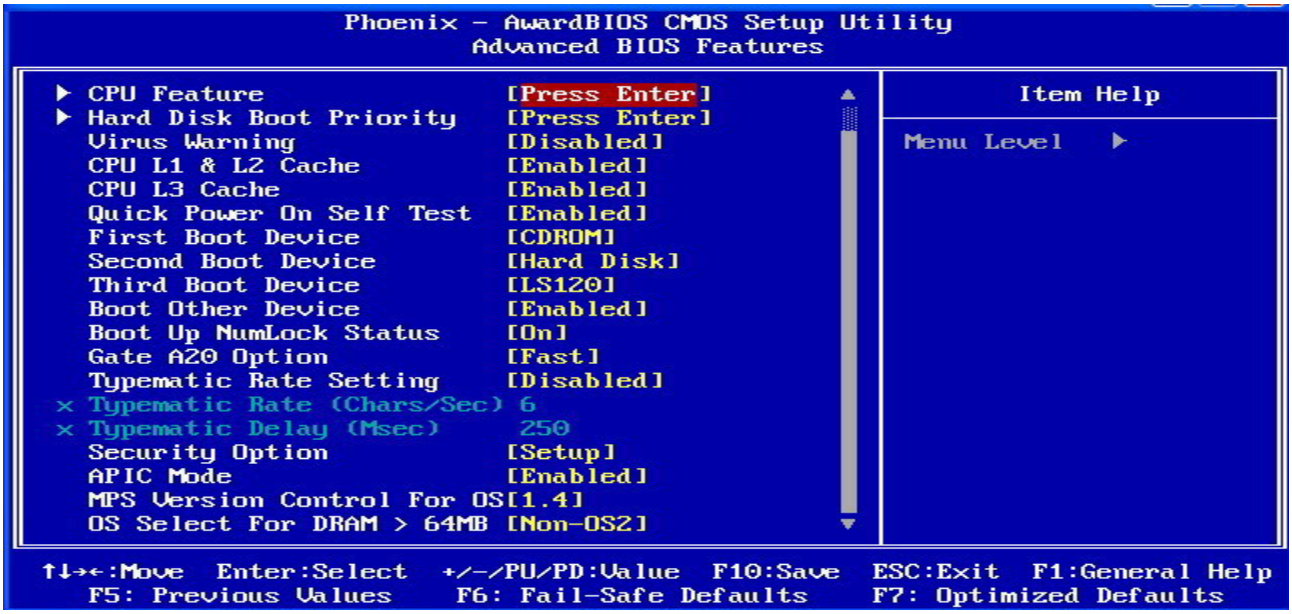
4.2.1.6 Extended Memory

Displays the amount of extended memory detected during boot up.

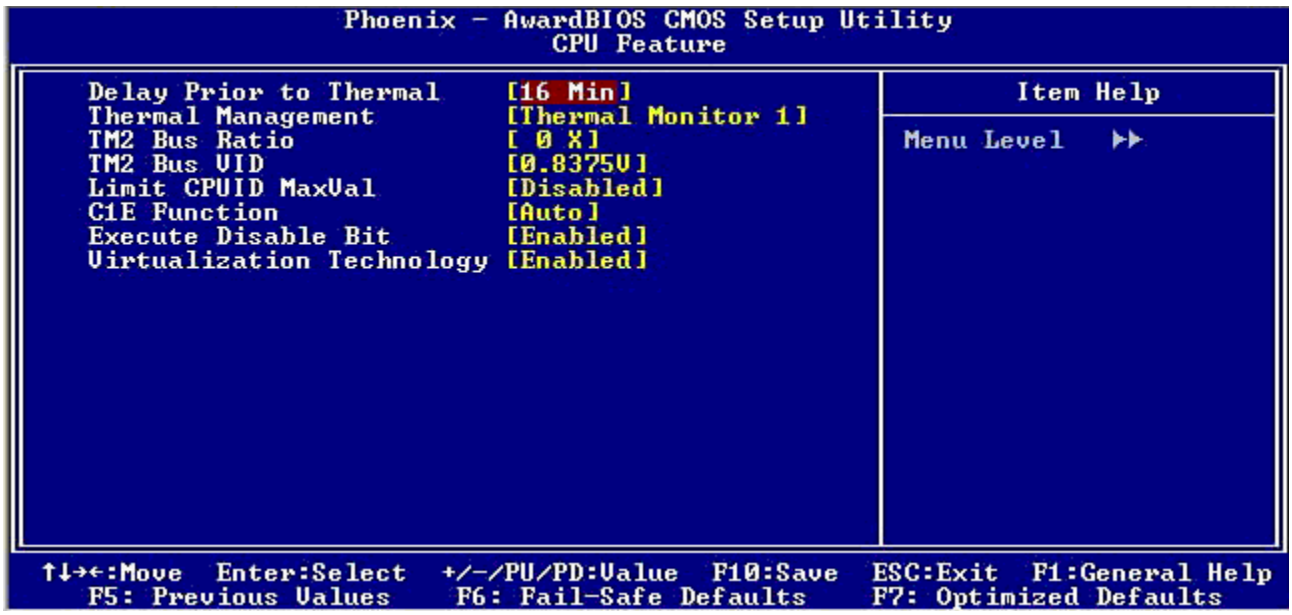
4.2.1.7 Total Memory

Displays the total memory available in the system.

4.2.2Advanced BIOS Features



4.2.2.1 CPU Feature



4.2.2.1.1Delay Prior to Thermal

Select the delay thermal time. Configuration options: [4min][8min][16min][32min]

4.2.2.1.2 Thermal Management

This BIOS feature controls the activation of the Thermal Monitor's automatic mode. It allows you to determine when the Pentium M4's Thermal Monitor should be activated in automatic mode after the system boots. In general, the Thermal Monitor should not be activated immediately on booting since the processor will be under a heavy load during the booting process, which results in the sharp rise in die temperature from its cold state, which leads to the unstable system. Therefore, to ensure optimal booting performance, the activation of the Thermal Monitor must be delayed for a set period of time. But how do you possibly know the optimal delay time? It is recommended that you set this to its lowest value that exceeds the time it takes to fully boot up your computer.
This item will monitor the CPU thermal to prevent the CPU damage from high temperature.

4.2.2.1.3 TM2 BUS Ratio

Select the Represents the frequency (bus ratio of the throttled performance state that will be initiated when the on-die sensor goes from not hot to hot

4.2.2.1.4 TM2 BUS VID

Select Represents the voltage of the throttled performance state that will be initiated when the on die sensor goes from not hot to hot.

4.2.2.1.5 Limit CPUID MaxVal

When the limit CPUID MaxVal is set to 3, the item should be set to "**Disabled**" for Windows XP. Options: Enabled、Disabled (default).

4.2.2.1.6 C1E Function

Select CPU C1E Function Select

4.2.2.1.7 Execute Disable Bit

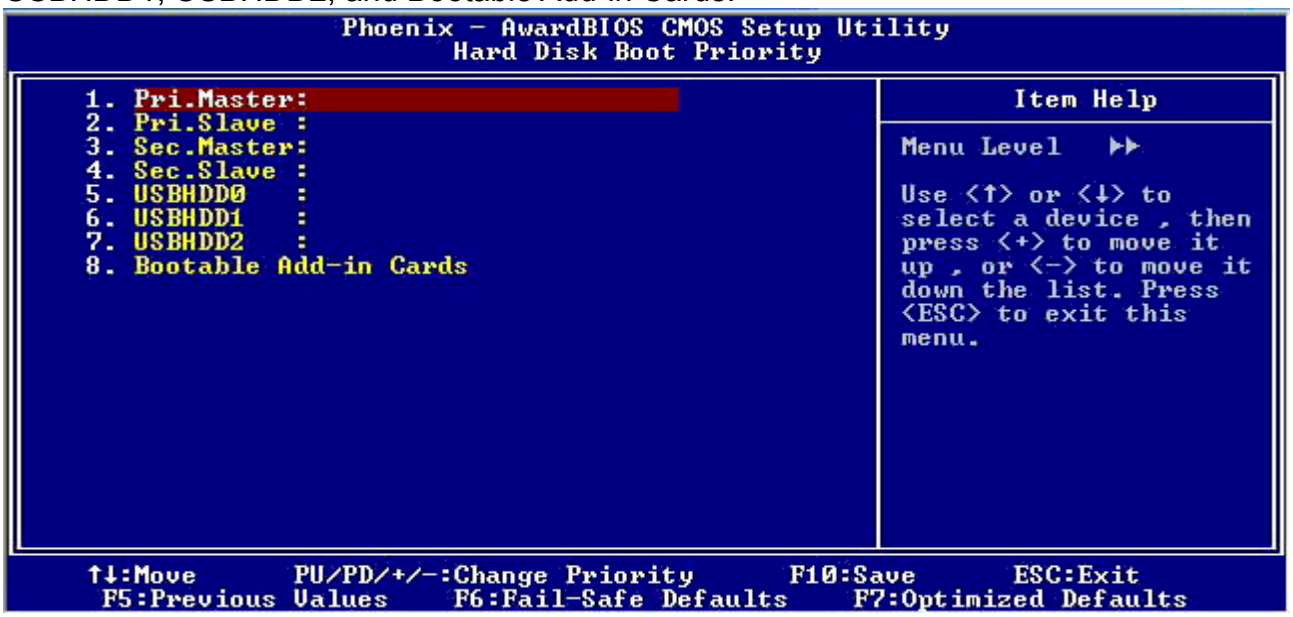
Select when disable, forces the XD feature flag to always return 0.

4.2.2.1.8 Virtualization Technology

Select when enable, a VMM can utilize the additional hardware capabilities provided by Vander pool Technology.

4.2.2.2 Hard Disk Boot Priority

Select removable device priority, such as Pri.Master, Pri,Slave, USBHDD0, USBHDD1, USBHDD2, and Bootable Add-in Cards.



4.2.2.3 Virus Warning

Allows to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempts to write data into this area, BIOS will show a warning message on screen and alarm beep.

4.2.2.4 CPU L1 & L2 Cache

Cache memory is much faster than conventional DRAM system memory. These fields allow you to enable or disable the CPUs Level 1 built-in cache and Level 2 external cache. Both settings are left as Enabled to significantly enhance the performance of your computer.

4.2.2.5 Hyper-Threading Technology

When you install a CPU featuring Hyper-Threading Technology, this item will allow you to enable or disable the Hyper-Threading technology. Options: Disabled、Enabled (default).

4.2.2.6 Quick Power On Self Test

Enable this function to reduce the amount of time required to run the POST (Power On Self Test). BIOS will save time by skipping certain tests during POST. It is recommended that you disable this setting. Finding a problem during boot up is better than loosing data during your work.

4.2.2.7 First/Second/Third Boot Device

Allow you to select the First, Second and Third Boot Device. If your computer is newly constructed, the next thing you want to do is load the Operating System from scratch, directly off its CD. Before that, you need to set the First Boot Device to the CDROM. This instructs the BIOS to boot from the CD drive before trying to boot from the hard drive, which is still blank.

4.2.2.8 Boot Up NumLock Status

This function defines the keyboard's numberpad as number keys or arrow keys. If it is set at On the number keys will be activated, if it is set at Off the arrow keys will be activated.

4.2.2.9 Typematic Rate Setting

When enabled, you can set the following two-typematic control items. When disabled, the keyboard controller determines keystrokes arbitrarily in your system.

4.2.2.10 Typematic Rate (Chars/Sec)

The typematic rate sets the rate at which characters on the screen repeat when a key is pressed and held down.

4.2.2.11 Typematic Delay (Msec)

The typematic delay sets how long after you press a key that a character begins repeating.

4.2.2.12 APIC Mode

By enabling this option, “MPS version control for OS” can be configured. Disabled is recommended.

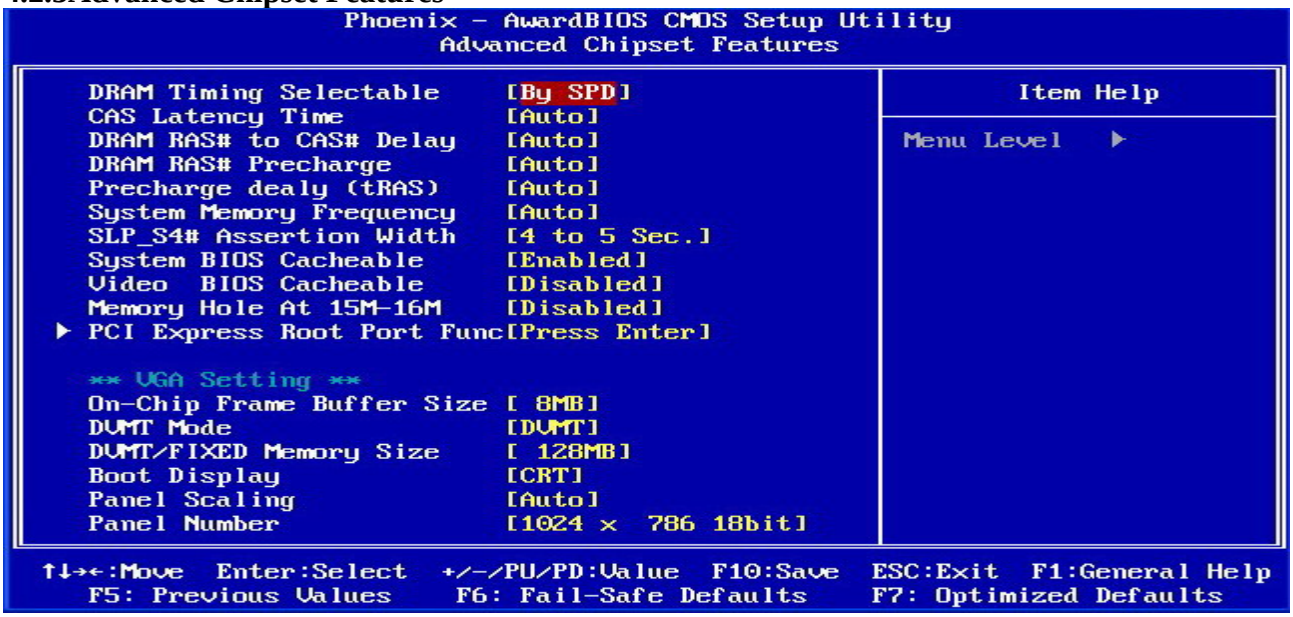
4.2.2.13 MPS Version Control for OS

The 1.1 version is the older version that supports 8 more IRQs in the Windows NT environment. Choose the new 1.4 version for Windows 2000 and Windows XP. Options: 1.4 (default)、1.1

4.2.2.14 OS Select For DRAM > 64MB

IBM’s relic. If your system's DRAM is larger than 64MB and you are running OS/2, select OS/2 as the item value. Otherwise, set the item value to Non-OS/2 for all other operating systems.

4.2.3Advanced Chipset Features



4.2.3.1 DRAM Timing Selectable

This item determines DRAM clock/timing using SPD or manual configuration. Make sure your memory module has SPD (Serial Presence Data), if you want to select the “By SPD” option. Options: Manual、By SPD (default)

4.2.3.2 CAS Latency Time

CAS is short for column address strobe, which is a kind of signals. When the CPU needs data from SDRAM, CAS signals will be sent via the CAS line to specify the column where the data is needed. This controls the time delay (in clock cycles - CLKs) that passes before the SDRAM starts to carry out a read command after receiving it. This also determines the number of CLKs for the completion of the first part of a burst transfer. In other words, the lower the latency, the faster the transaction.

Note that some SDRAM modules may not be able to handle the lower latency and will become unstable and lose data. Therefore, set the DRAM CAS Latency Time to **2** for optimal performance if possible but increase it to **2.5** if your system becomes unstable.

Interestingly, increasing the CAS latency time does have an advantage in that it will enable the SDRAM to run at a higher clockspeed, thereby giving you an edge in overclocking your system. So, if you hit a snag while overclocking, try increasing the CAS latency time.

4.2.3.3 DRAM RAS# to CAS# Delay

This item allows you to select a delay time between the CAS and RAS strobe signals. It only applies when DRAM is written to, read from, or refreshed. This field is adjustable only when “DRAM Timing Selectable” is set to “manual”. This field is locked when “DRAM Timing Selectable” is set to “By SPD” and is automatically determined by the system. Options: 5、4、3、2.

4.2.3.4 DRAM RAS# Precharge

This item allows you to select the DRAM RAS# precharge time. The ROW address strobe must precharge again before DRAM is refreshed. An inadequate configuration may result in incomplete data. This field is adjustable only when “DRAM Timing Selectable” is set to “manual”. This field is locked when “DRAM Timing Selectable” is set to “By SPD” and is automatically determined by the system. Options: 5、4、3、2.

4.2.3.5 Precharge Delay

This item allows you to select DRAM Active to Precharge Delay. This field is locked when “DRAM Timing Selectable” is set to “By SPD” and is automatically determined by the system. Options: 15、14、13、12、11、10、9、8、7、6、5、4.

4.2.3.6 System BIOS Cacheable

Enabling this function allows caching of the system BIOS ROM at F0000h-FFFFFh, which results in better system performance. However, if any program writes to this memory area, a system error may result. It is advisable to leave it in default setting. Caching the system BIOS results in better performance than shadowing the system BIOS.

4.2.3.7 Video BIOS Cacheable

Select “Enabled” to allow caching of the video BIOS which may improve performance. If any other program writes to this memory area, a system error may result. Options: Enabled, Disabled (default)

4.2.3.8 Memory Hole at 15M-16M

Enabling this function will reserve the memory address space between 15MB and 16MB for ISA expansion cards. However, it will also result in not allowing the system to have access to memory above 16MB. Please note that some expansion cards require this setting to be enabled. The default setting is Disabled. If Auto Configuration is enabled, you must set the DRAM timing function to 60ns or 70ns, depending on the type of DRAM you install.

4.2.3.9 PCI Express Root Port Function

This item allows to Enable/Disable PCI Express port and select the PCI Express Compliancy mode from v1.0a to v1.0.

4.2.3.10 On-Chip Frame Buffer Size

This item allows you to setting the VGA memory form share system. Options: 1M(minimum)、8M(Maximum default)

4.2.3.11 DVMT Mode

DVMT/FIXED Memory Size

4.2.3.12 Boot Display

This item allows you to setting CRT monitor only or CRT with EFP(DVI) together display.

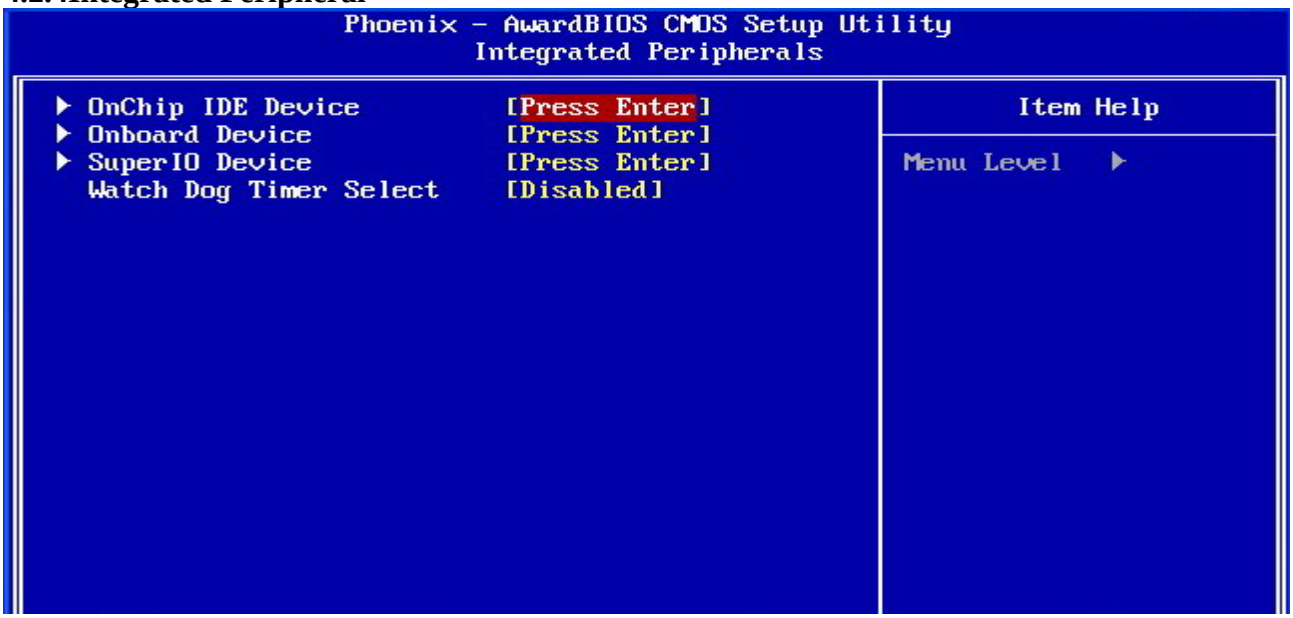
4.2.3.13 Panel Scaling

This item is for the backlight scaling techniques dynamically dimming the backlight to conserve its power consumption as increasing the panel transmittance to maintain the same luminance. Most displays use either spatial or temporal method to synthesize colors.

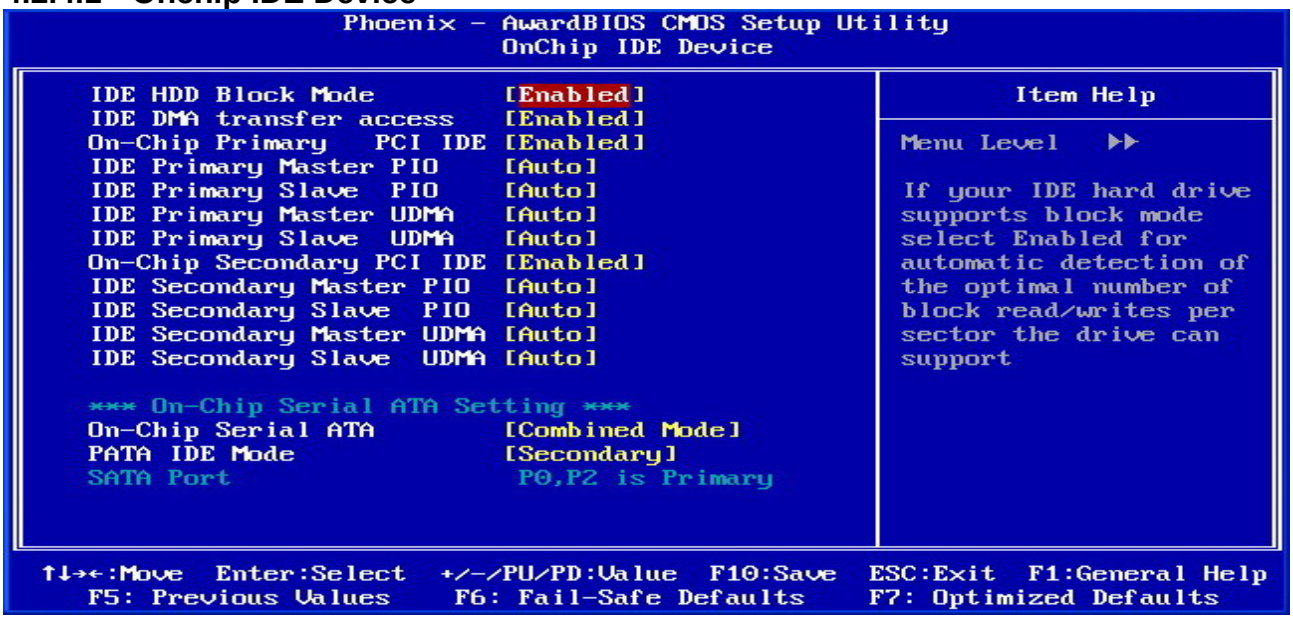
4.2.3.14 Panel Number

This item allows to select panel resolution that will be displayed depending on the LCD panel (LFP).

4.2.4Integrated Peripheral



4.2.4.1 Onchip IDE Device



4.2.4.3.1 IDE HDD Block Mode

Block mode is also called block transfer, multiple commands, or multiple sector read/write. If the IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

4.2.4.3.2 IDE DMA Transfer Access

This item could allows you to enabled/disabled the IDE UDMA transfer function and only use PIO mode

4.2.4.3.3 On-Chip Primary/Secondary PCI IDE

The chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the primary IDE interface. Select Disabled to deactivate this interface.

4.2.4.3.4 IDE Primary/Secondary Master/Slave PIO

The IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

4.2.4.3.5 IDE Primary/Secondary Master/Slave UDMA

Ultra DMA implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If the hard drive and the system software both support Ultra DMA, select Auto to enable BIOS support.

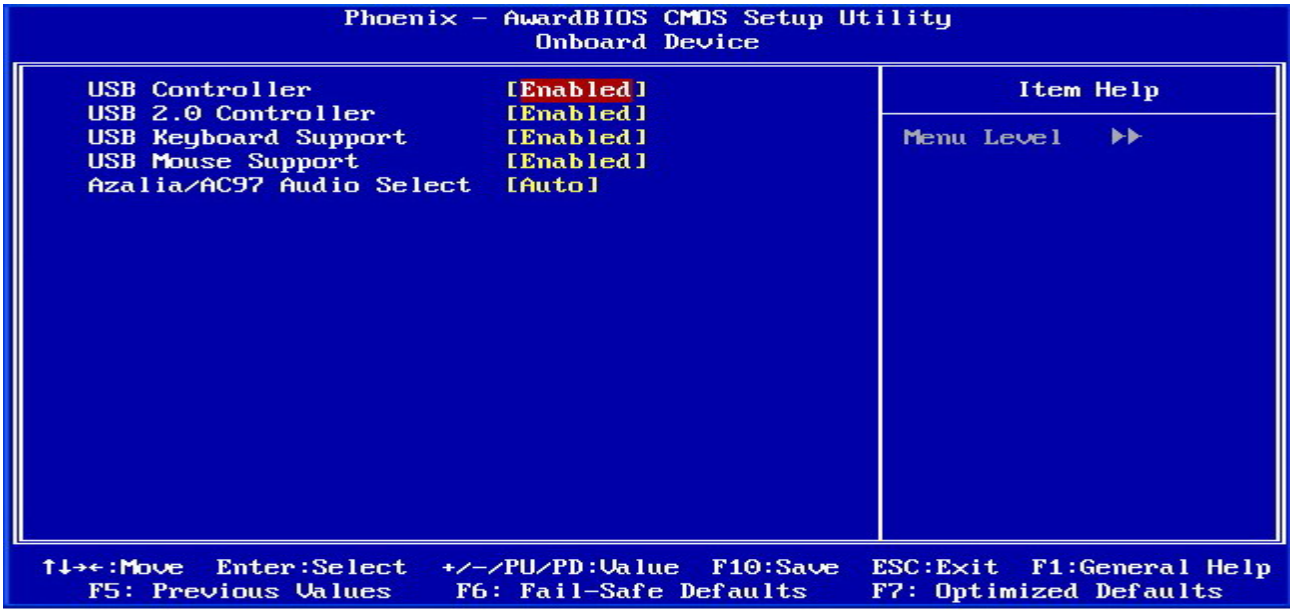
4.2.4.3.6 On-Chip Serial ATA

The chipset contains a SATA IDE interface with support for two IDE channels. Select Enabled to activate the primary IDE interface (Channel0). Select Disabled to deactivate this interface.

4.2.4.3.7 PATA IDE Mode

This function allows to select PATA IDE mode.

4.2.4.2 Onboard Device



4.2.4.3.1 USB Controller

This item allows you to set the USB Controller.

4.2.4.3.2 USB 2.0 Controller

This item allows you to set the USB 2.0 Controller.

4.2.4.3.3 USB Keyboard Support

This item allows you to set the system's USB keyboard to Enabled/Disabled.

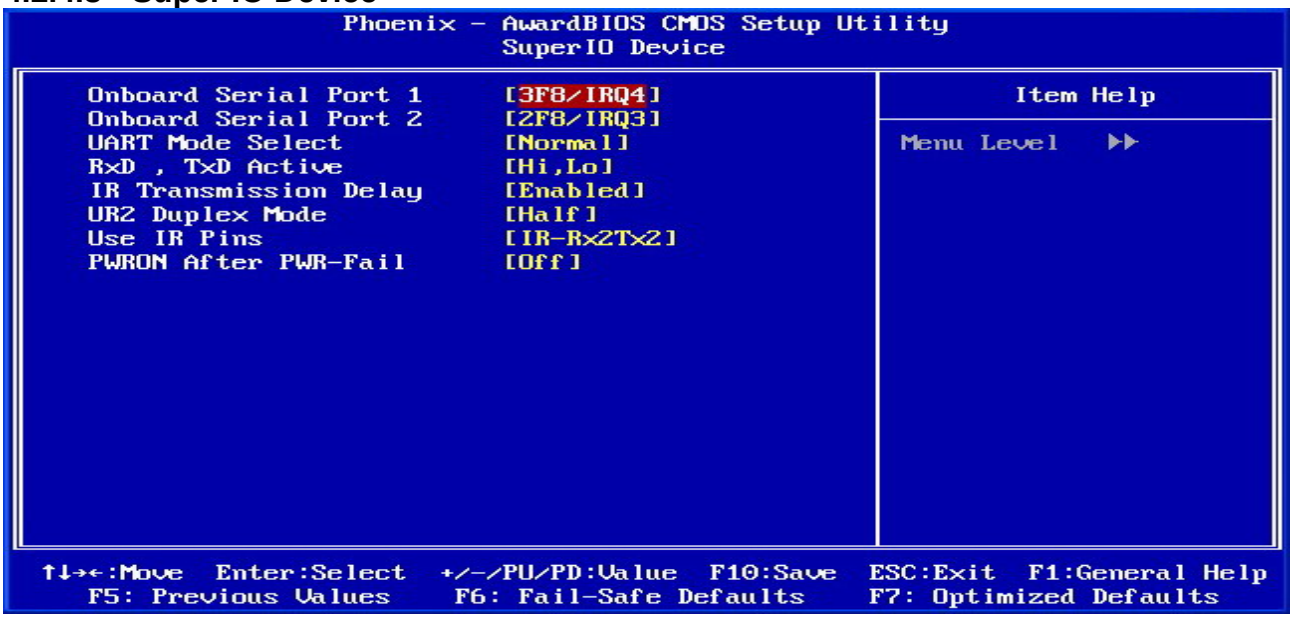
4.2.4.3.4 USB Mouse Support

This item allows you to set the system's USB Mouse to Enabled/Disabled.

4.2.4.3.5 Azalia/AC97 Audio Select

This option is used to Set whether onboard Azalia/AC97 audio is enabled

4.2.4.3 Super IO Device



4.2.4.3.1 Onboard Serial Port 1/2

Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you are not going to use FDC or the system has no floppy drive, select Disabled in this field.

4.2.4.3.2 UART Mode Select

Select an address and corresponding interrupt for the first and second serial ports.

4.2.4.3.3 RxD,TxD Active

This BIOS feature allows to set the infra-red reception (RxD) and transmission (TxD) polarity. There are four options available, based on combinations of Hi and Lo. Please consult the IR peripheral's documentation to determine the correct polarity, or the wrong polarity will prevent a proper IR connection from being established with the IR peripheral.

4.2.4.3.4 IR transmission Delay

The field enables or disables IR transmission delay function.

4.2.4.3.5 UR2 Duplex Mode

Select the value required by the IR device connected to the IR port. Full-duplex mode permits simultaneous two-direction transmission. Half-duplex mode permits transmission in one direction only at a time.

4.2.4.3.6 Use IR Pins

Select the correct setting of TxD and RxD signals.

4.2.4.3.7 PWRON After PWR-Fail

This item is to set whether to run Ac Loss Auto Restart or off

4.2.4.4 Watch Dog Timer Select

This function will determine watch dog timer during the range of 10 Sec., 20 Sec., 30 Sec., 40 Sec., 1 Min., 2 Min., and 4 Min. The default setting is Disabled.

4.2.5Power Management Setup

4.2.5.1 ACPI Function

This function enables PCs to implement Power Management functions through Operating System and also provides the opportunity to integrated the interface for controlling power management and Plug-n-Play features on system devices.

4.2.5.2 ACPI Suspend Type

This item allows to set the ACPI suspend(sleep) mode instead of simply turning off a computer. In S1 the computer consumes less power because HDDs and some other devices are powered off, but CPU is still running and it requires its fan to rotate. In S3 mode it's only RAM (system memory) that remains powered.

4.2.5.3 Run VGABIOS if S3 Resume

This item is to select whether to run VGABIOS if resumed from S3 state but for older VGA drivers only. Please select Auto (Default) if in doubt.

4.2.5.4 Power Management

There are three selections for power management and HDD power down. The Min. Power Saving sets the HDD Power Down at 15 Min., Max. Power Saving at 1 Min., and User defined from 1 Min. to 15 Min. and disabled but from 1 Min. to 1 hour while disabled.

4.2.5.5 Video Off Method

Determines the manner in which the monitor is blanked. V/H SYNC + Blank turns off vertical and horizontal synchronization ports and writes blanks to the video buffer; DPMS Support is for the monitor supports the Display Power Management Signaling(DPMS) standard of the Video Electronics Standards Association(VESA); Blank Screen set the system only writes blanks to the video buffer.

4.2.5.6 Video Off In Suspend

This item allows to set if the monitor is blanked in Suspend mode. The default setting is Yes.

4.2.5.7 Suspend Type

This item will set the system status to shut down the PC with choices of Stop Grant and PwrOn Suspend.

4.2.5.8 MODEM Use IRQ

This determines the IRQ in which the MODEM can use.

4.2.5.9 Sort-Off by PWR-BTTN

Pressing the power button for more than 4 seconds/Instant-Off forces the system to enter the Soft-Off state when the system has “hung”.(Only could working on ATX Power supply).

4.2.5.10 Wake-Up by PCI Card

This will enable the system to wake up through PCI Card peripheral or not.

4.2.5.11 Power On by Ring

The function allows the system boot up if there’s an incoming call from the modem.

4.2.5.12 USB KB Wake-Up From S3

This option is used to enabled/disabled USB keyboard wake up with suspend to RAM.

4.2.5.13 Primary/Secondary IDE 0/1

This function is for setting IDE 0/1 on primary/secondary mode.

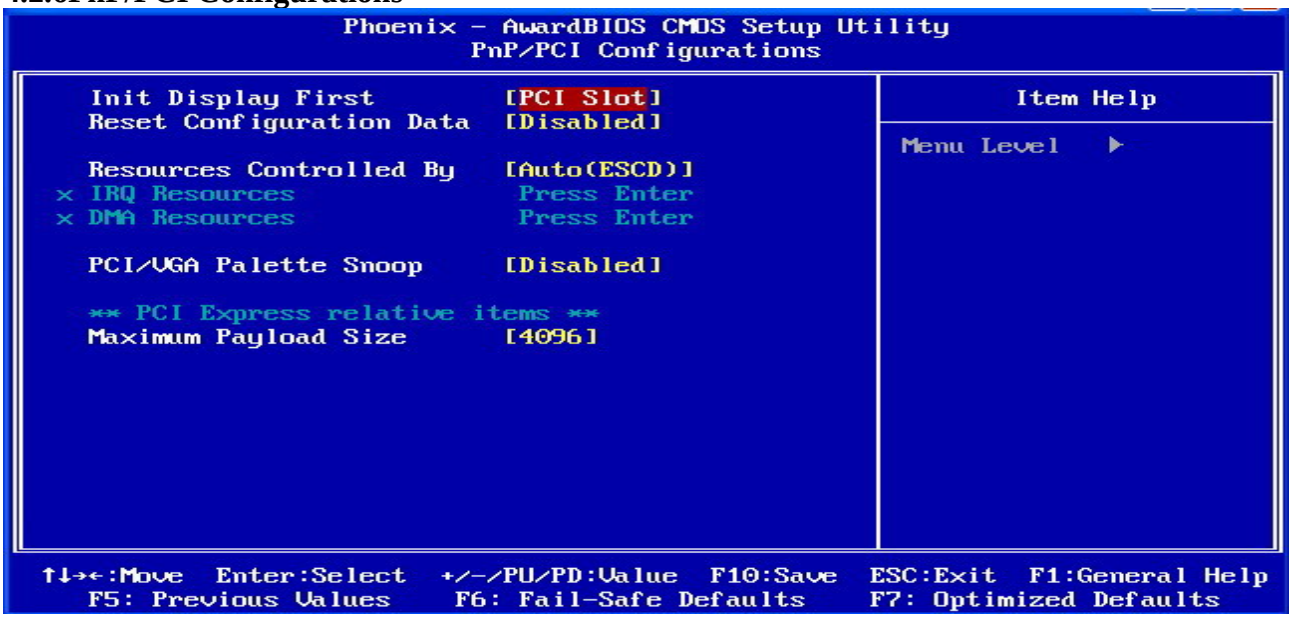
4.2.5.14 FDD,COM,LPT Port

System can be awaked by Floppy Drive, COM or LPT port.

4.2.5.15 PCI PIRQ[A-D]#

This function will cause the system waking up completely from the power management mode.

4.2.6PnP/PCI Configurations



4.2.6.1 Init Display First

This item allows you to decide to active whether PCI Slot or Onboard/AGP first.

4.2.6.2 Reset Configuration Data

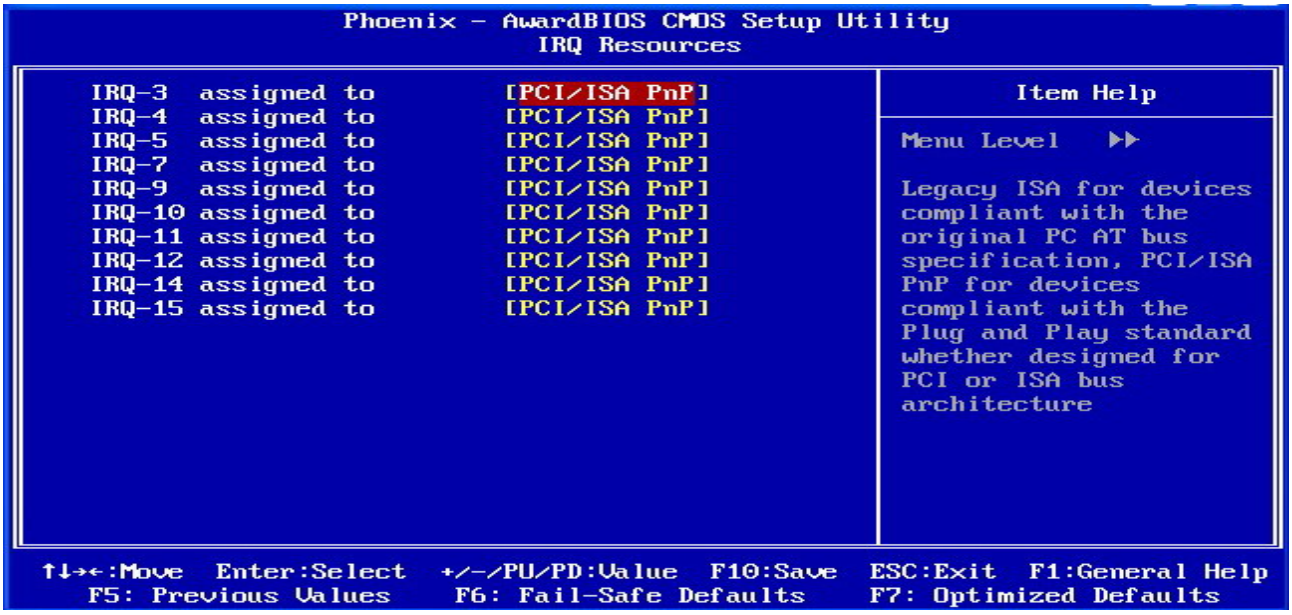
Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot.

4.2.6.3 Resources Controlled By

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows®95. If you set this field to “manual” choose specific resources by going into each of the sub menu that follows this field.

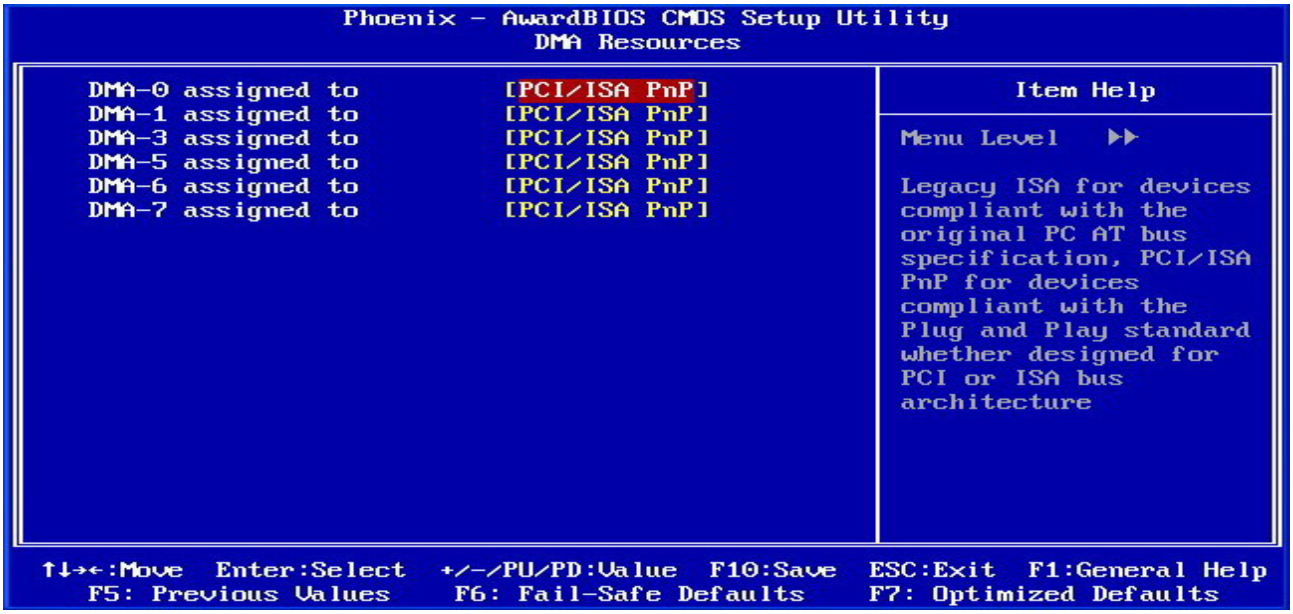
4.2.6.3.1 IRQ Resources

This item allows you to determine the IRQ assigned to the ISA bus and is not available to
any PCI slot. Legacy ISA for devices compliant with the original PC AT bus specification,
PCI/ISA PnP for devices compliant with the Plug and Play standard whether designed for
PCI or ISA bus architecture.



4.2.6.3.2 DMA Resources

This item allows you to determine the DMA assigned to the ISA bus and is not available to
any PCI slot. Legacy ISA for devices compliant with the original PC AT bus specification,
PCI/ISA PnP for devices compliant with the Plug and Play standard whether designed for
PCI or ISA bus architecture.


Phoenix - AwardBIOS CMOS Setup Utility
DMA Resources
DMA-0 assigned to [PCI/ISA PnP]
DMA-1 assigned to [PCI/ISA PnP]
DMA-3 assigned to [PCI/ISA PnP]
DMA-5 assigned to [PCI/ISA PnP]
DMA-6 assigned to [PCI/ISA PnP]
DMA-7 assigned to [PCI/ISA PnP]
Item Help
Menu Level ▶▶
Legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PnP for devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

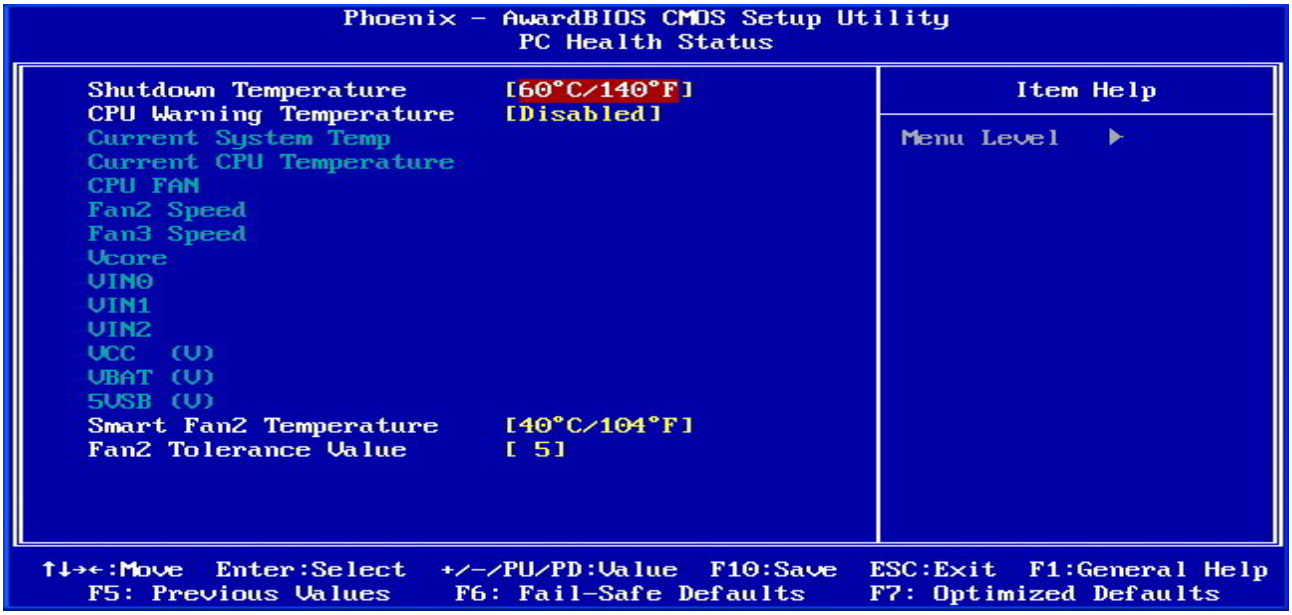
4.2.6.4 PCI/VGA Palette Snoop

This function determines if the graphics card should allow VGA palette snooping by a fixed function display card. It is only useful if a fixed-function display card using that requires a VGA-compatible graphics card to be present. Otherwise, leave the setting as default Disabled.

4.2.6.5 Maximum Payload

This item allows to set the maximum TLP payload size (unit in byte) for the PCI Express devices.

4.2.7PC Health Status



4.2.7.1 Shutdown Temperature

This item allows to shutdown the system while the temperature is overheated.

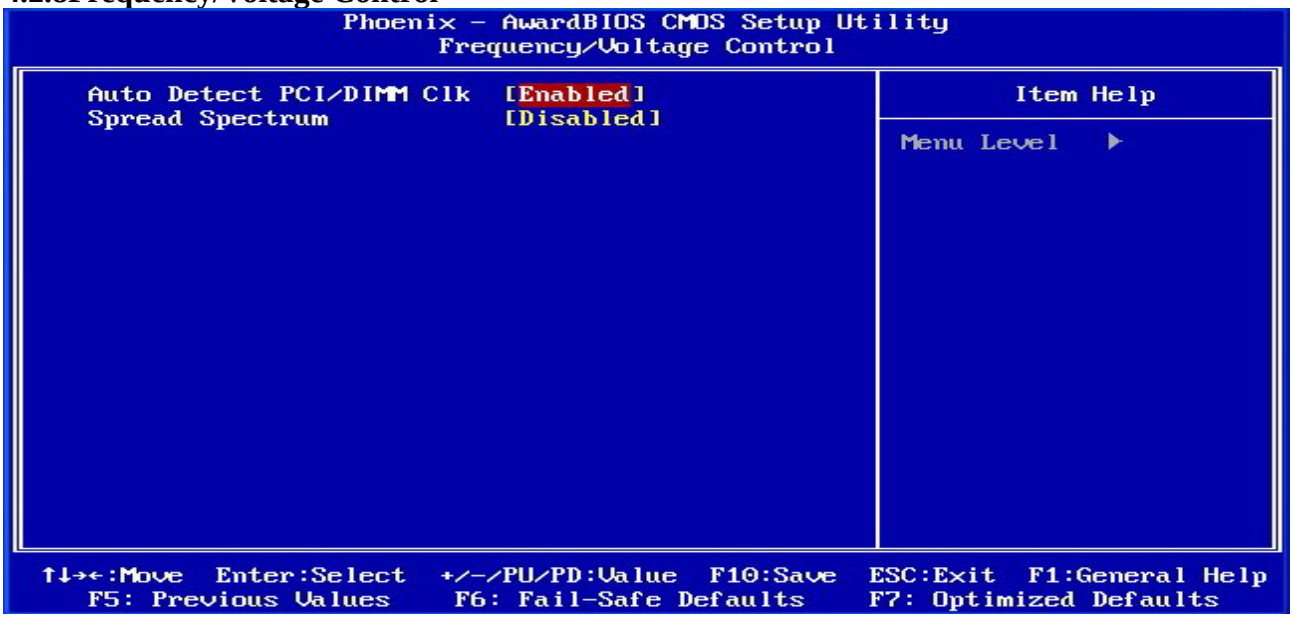
4.2.7.2 CPU Warning Temperature

This function sets the CPU temperature value when the system will warn you about possible overheating issue.

4.2.7.3 Smart CPU FAN Temperature

The Smart CPU Fan option in the BIOS slows down the fan when the CPU is below a given temperature.

4.2.8Frequency/Voltage Control



4.2.8.1 Auto Detect PCI/DIMM Clk

This item allows to enable/disable auto detect PCI/DIMM clock.

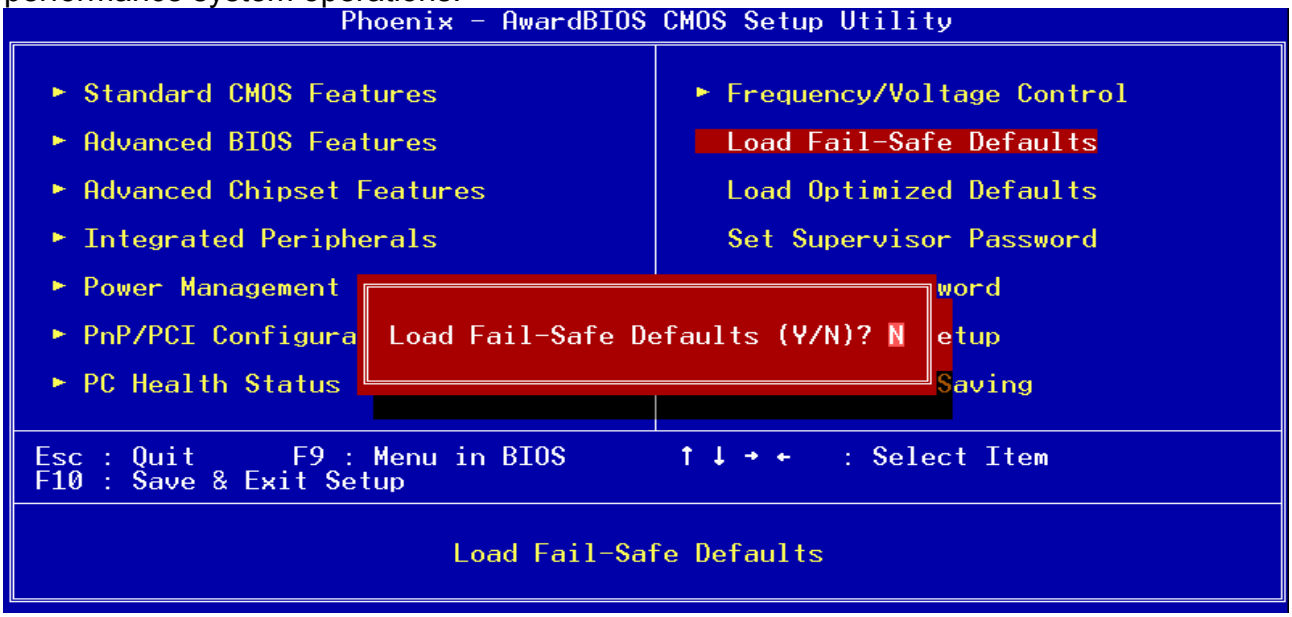
4.2.8.2 Spread Spectrum

This is to adjust extreme value of the pulse for EMI test.

4.2.9Load Fail-Safe Default

Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate.

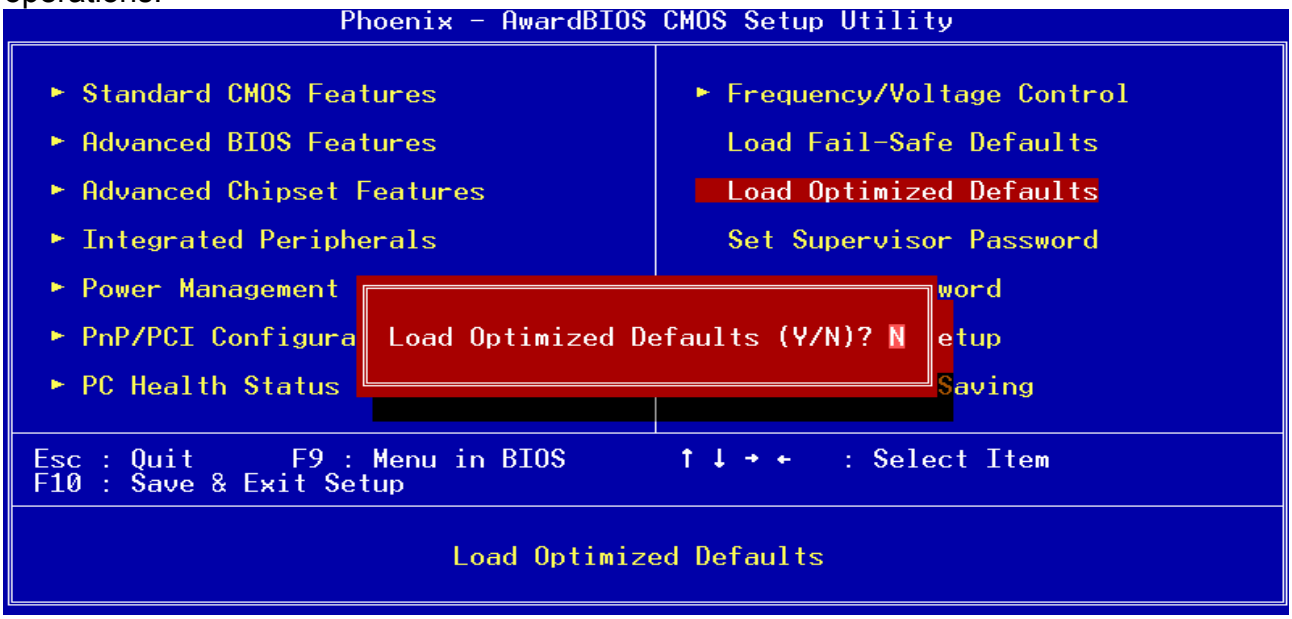
Press <Y> to load the BIOS default values for the most stable, minimal-performance system operations.



4.2.10 Load Optimized Defaults

Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While Award has designed the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs.

Press <Y> to load the default values setting for optimal performance system operations.

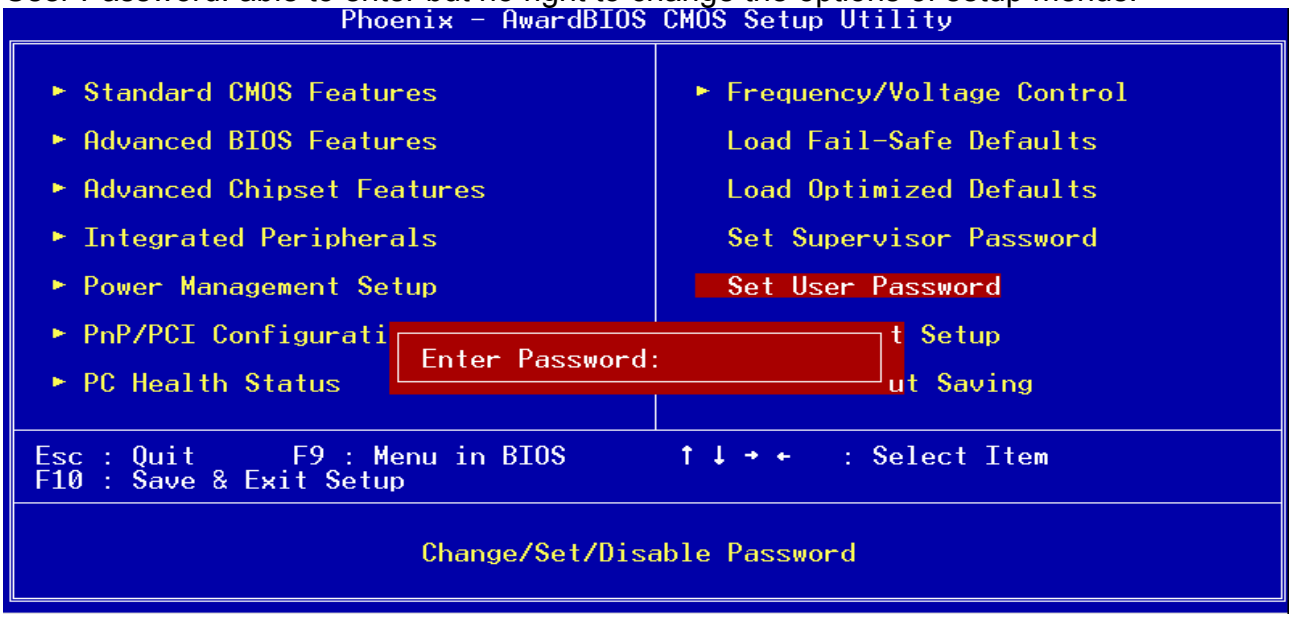


4.2.11 Supervisor/User Password Setting

You can set either supervisor or user password, or both of them.

Supervisor Password: able to enter/change the options of setup menus

User Password: able to enter but no right to change the options of setup menus.



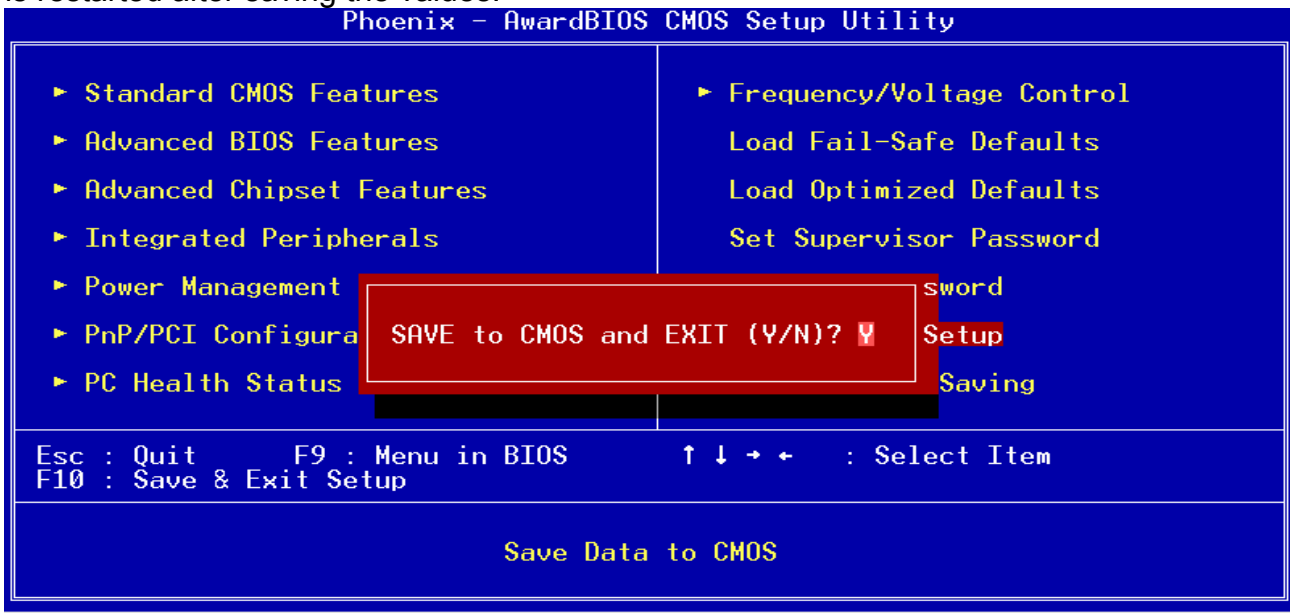
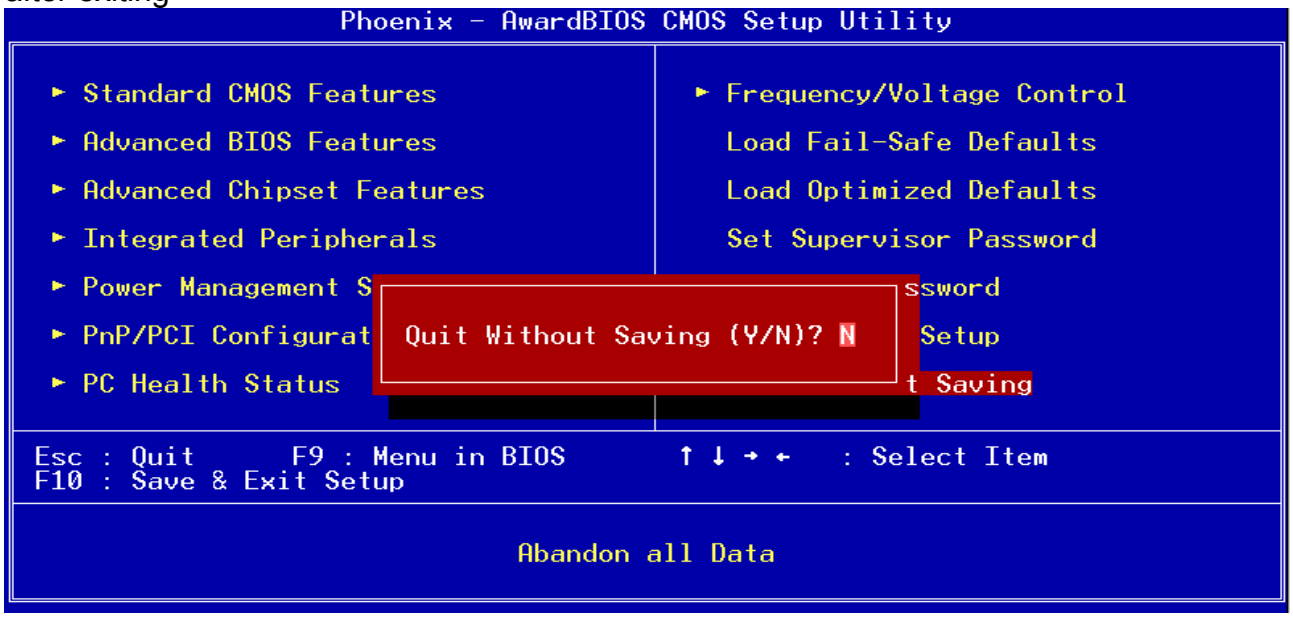
Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password. To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED.

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration. Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer. You determine when the password is required within the BIOS Features Setup Menu and its Security option (see Section 3). If the Security option is set to “System”, the password will be required both at boot and at entry to Setup. If set to “Setup”, prompting only occurs when trying to enter Setup

4.2.12 Exit Selection

Save CMOS value changes to CMOS and exit setup. Enter <Y> to store the selection made in the menus in CMOS, a special section in memory that stays on after turning the system off. The BIOS configures the system according to the Setup selection stored in CMOS when boot the computer next time. The system is restarted after saving the values.



Abandon all CMOS value changes and exit setup, and the system is restarted after exiting